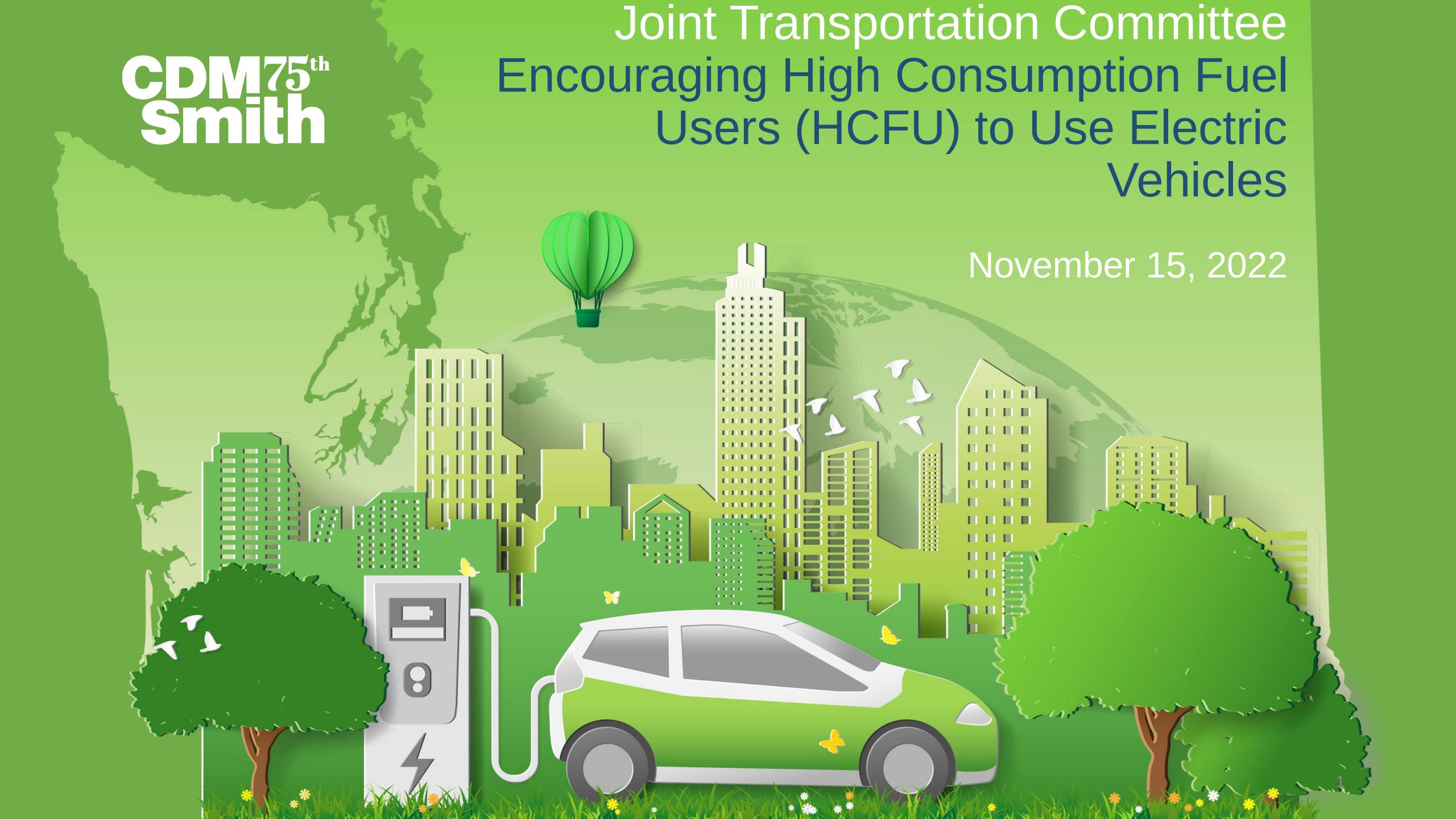
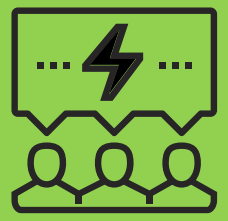
Joint Transportation Committee
Encouraging High Consumption Fuel Users (HCFU) to Use Electric Vehicles

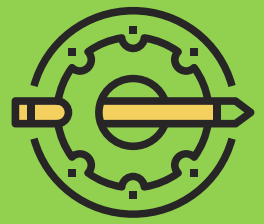
November 15, 2022



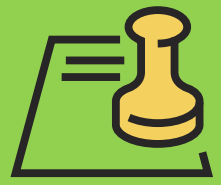
CDM Smith + Ipsos Team



Expert Practitioners in Energy and Public Sector



Analysis, Guidance, and Implementation



Experience with DOLs DRIVE system

Unique Approach; IPSOS Consumer Research

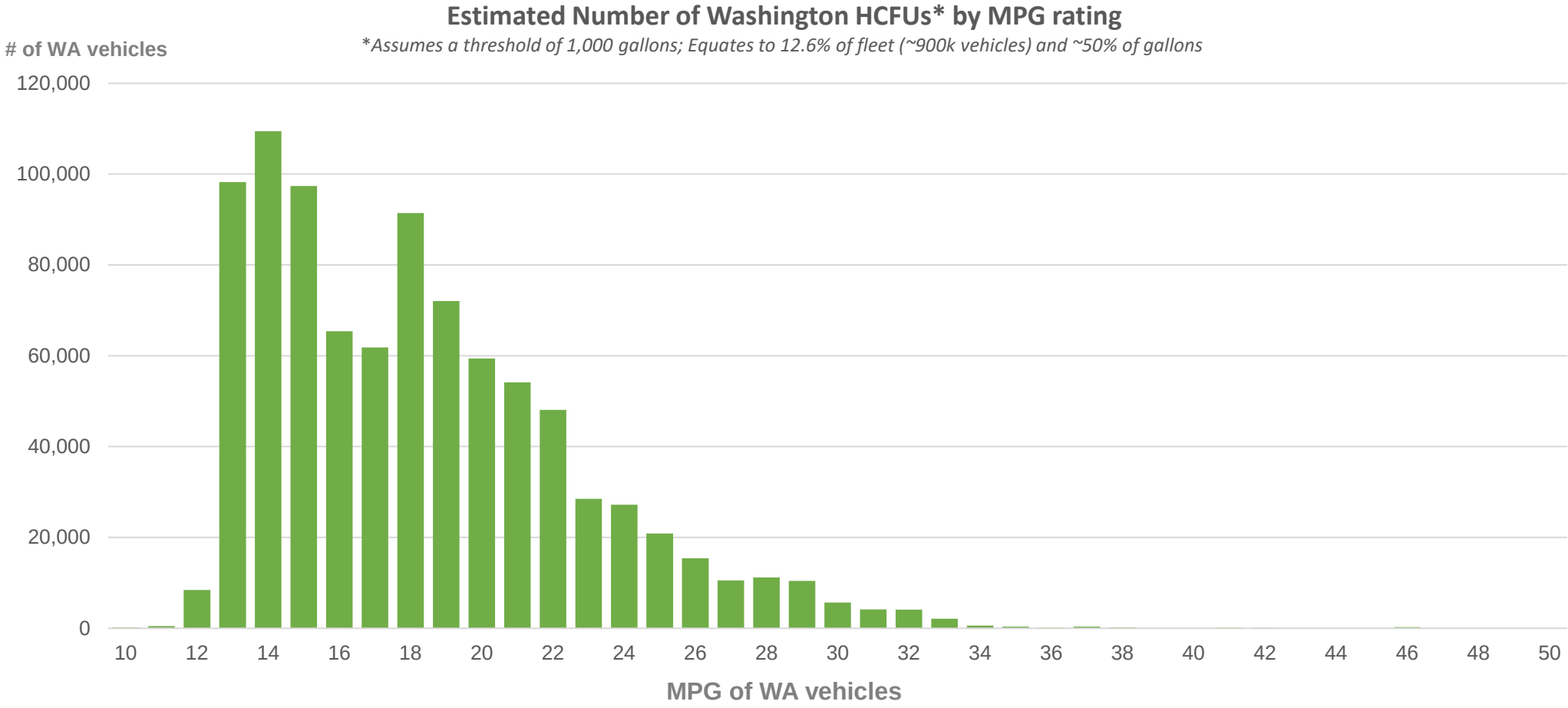
Understanding of Washington state legislature and policy

CDM Smith

Topics for today's meeting

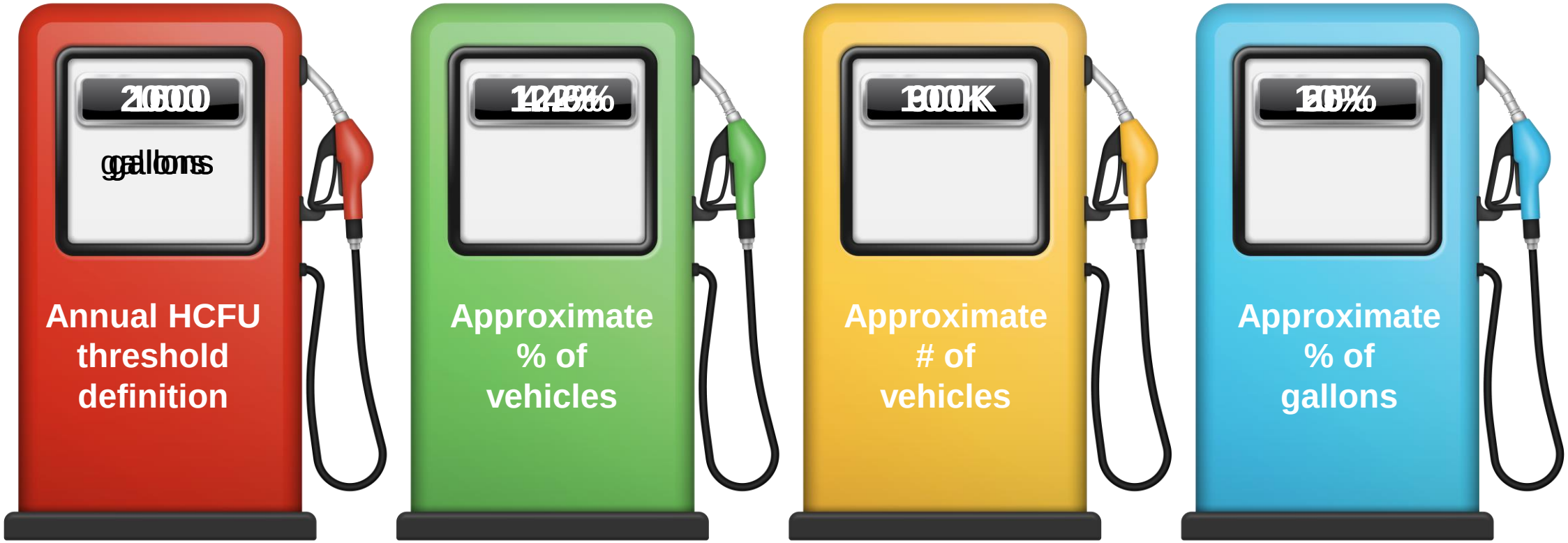
- Context for this study
- Main Task Areas
- Preview of Task 1: issues and trends related to EV adoption
- Study deliverables and schedule

Study context: What policies might be effective in persuading drivers who use a disproportionate amount of gasoline to switch to electric vehicles?



*Estimates are based on counts of Washington vehicles by MPG from decoded DOL registry data, with a distribution of miles driven applied based on NHTS data

Study context: What policies might be effective in persuading drivers who use a disproportionate amount of gasoline to switch to electric vehicles?



**Estimates are based on counts of Washington vehicles by MPG from decoded DOL registry data, with a distribution of miles driven applied based on NHTS data*

Study context:
A relatively small percentage of drivers (4.2%) burn a disproportionate amount of gasoline.

Annual HCFU threshold definition	Approximate % of vehicles	Approximate # of vehicles	Approximate % of gallons
2,000 gallons	1.4%	100k	10%
1,500 gallons	**4.2%**	**300k**	**25%**
1,000 gallons	12.6%	900k	50%

**Estimates are based on counts of Washington vehicles by MPG from decoded DOL registry data, with a distribution of miles driven applied based on NHTS data*

Project goals and objectives

*“Study and assess strategies to encourage high consumption fuel users (HCFU) to switch to electric vehic*les.”

Study tasks fall into two broad categories:

Background data:

- Identify which HCFUs can switch to EVs
- Calculate how much money would those users save
- Calculate how many gallons of fuel would be displaced

Consumer choice data and analysis by conducting market analysis

- HCFUs attitudes and perception of EVs
- Perceived barriers to HCFU adoption of EVs
- Identifying effective messages to encourage the transition
- Identifying policies to encourage the transition.

How tasks fit together to identify effective policies

Task 1

Understand broader issues and trends

Task 2

Apply data analytics to understand ability of HCFUs to convert to EVs

Task 3

Probing decision-factors of HCFUs and testing draft policies and messages

Task 4

Develop strategies to encourage HCFU to switch to EV

Task 1: Understanding broader issues and trends affecting EV adoption

Light duty vehicles weigh less than 10,000 lbs. GVW

Ford F250

Ford Explorer

Ford Transit Connect

Electric Vehicles (RCW 46.17.323)

Nissan Leaf
Battery Electric Vehicle

Kia Sorrento
Plug-in Hybrid Electric Vehicle

Zero-Emission Vehicles (RCW 46.17.323)

Nissan Leaf
Battery Electric Vehicle

Kia Sorrento
Plug-in Hybrid Electric Vehicle

Hyundai NEXO
Hydrogen Fuel Cell Vehicle

Hydrogen Fuel Cell Electric Vehicles:

Currently only available in California, where limited hydrogen fueling stations exist.

2022 Toyota Mirai
Hydrogen Fuel Cell Vehicle

Time horizons: current conditions, near-term, mid-term, and longer-term

Supply challenges

- **Retail availability**
- **Model variety**
- **Supply chain constraints**
- **Used car inventory**

- Retail availability
- Model variety
- Supply chain constraints
- Used car inventory

- Retail availability
- Model variety
- **Battery components**
- Used car inventory

- Model variety
- Battery components
- Used car inventory

Macro-economic factors

- Comparative price of fuel (gas vs. electricity)
- New technology adoption rate
- General economic conditions

Now | Near-term | Mid-term | Longer-term

Demand challenges

- Driving range
- Purchase price
- Charging station availability
- **Model variety**

- Driving range
- Purchase price
- Charging station availability
- Model variety

- Driving range
- Purchase price
- Charging station availability
- Model variety

- Purchase price
- Charging station availability
- Model variety

Policy incentives

- Purchase rebates
- R&D and manufacturing incentives
- Public charging infrastructure
- Operating incentives (free parking, etc.)

Supply side challenges: Retail availability is currently constrained.

Supply side challenges: Retail availability is currently constrained.

Current causes: component part shortages (e.g., computer chips), manufacturing plant ramp-up, supply chain disruptions (COVID, war, etc.)…and strong consumer demand.

Wait time examples	
Tesla Model Y – Long Range	4 months (down from 1 year)
Tesla Model X	June 2023
Volkswagen ID 4	
Audi E-Tron	
Porsche Taycan	
Ford Mach-E SUV	
Ford F-150 Lightening	By reservation only – wait time up to 3 years

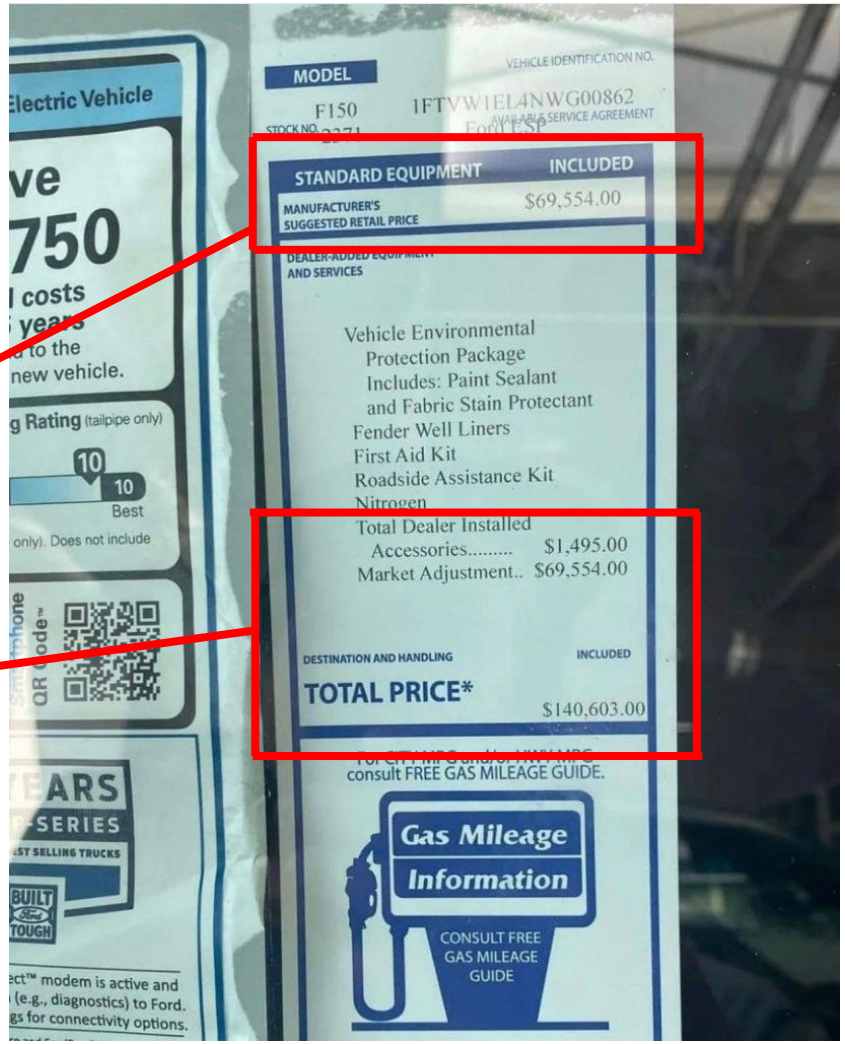
SOLD OUT FOR 2022

**Volkswagen announced being sold out in June of 2022.*

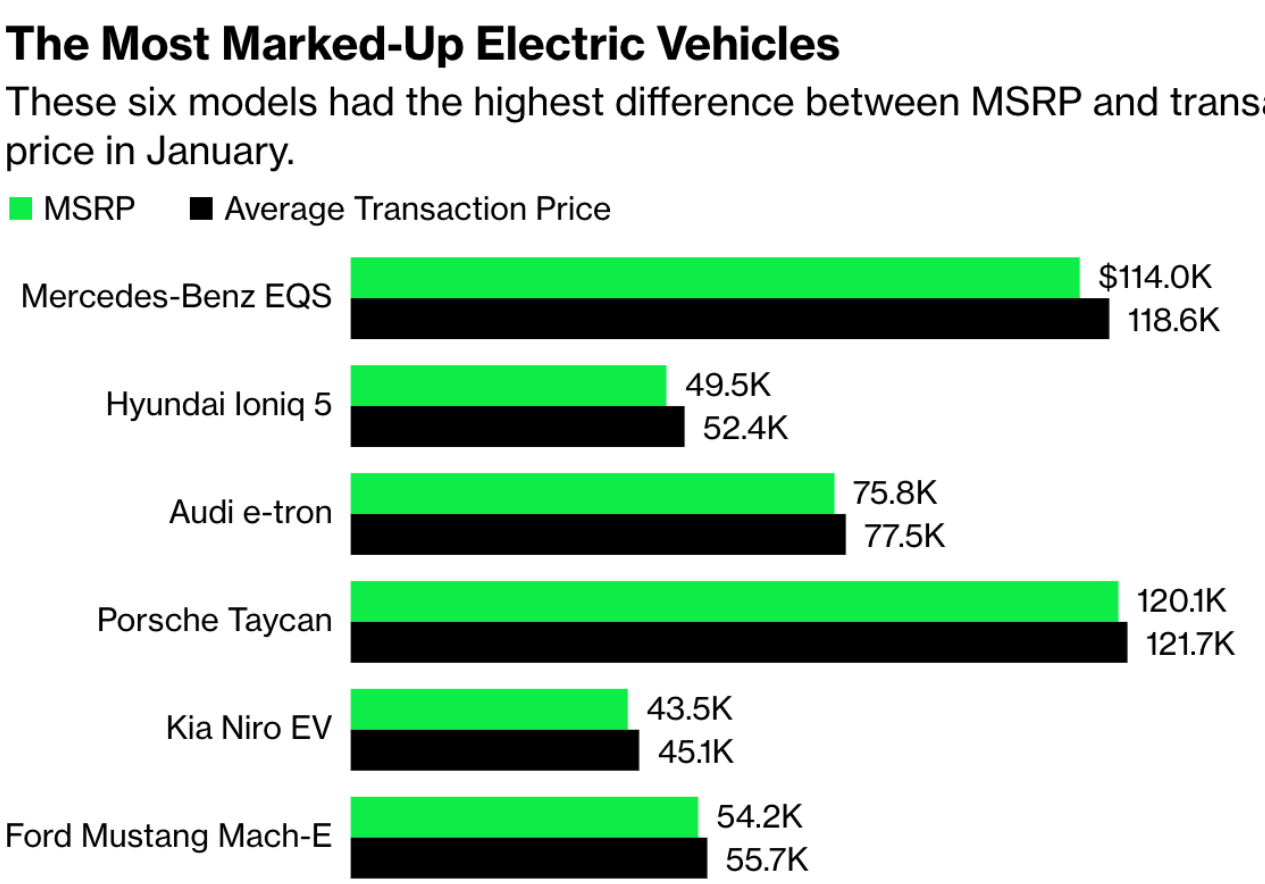
Supply side challenges: when demand exceeds supply, prices increase.

Ford dealers are taking advantage of strong demand for F-150 Lightning, marking it up by $30,000

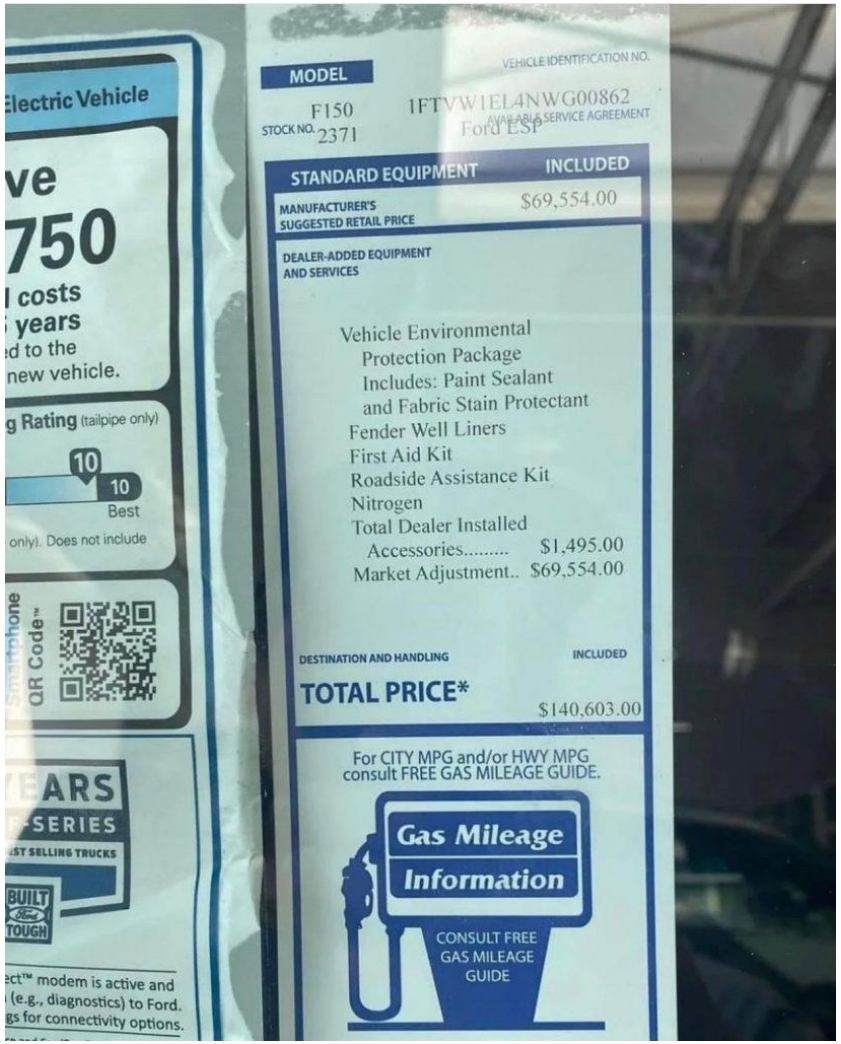
Fred Lambert | Dec 30 2021 — 11:33 am PT



Supply side challenges: when demand exceeds supply, prices increase.

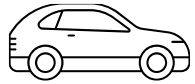
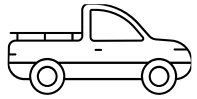
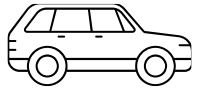
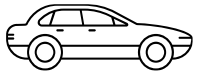
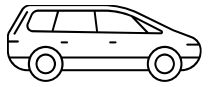
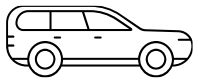


Source: Edmunds



Supply side challenges: EV model diversity has been lacking, but is catching up

2022 US new car purchases (models available)

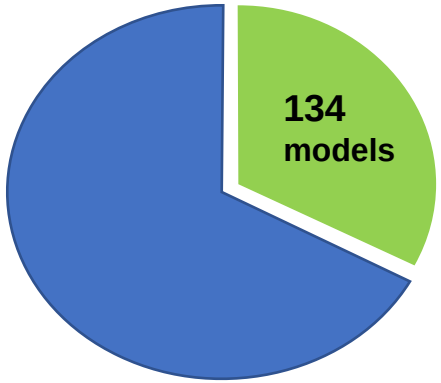
	**Crossovers (33)**	**45.1%**
	**Pickup Trucks (34)**	**19.3%**
	**Sport Utility Vehicles (67)**	**10.3%**
	Midsize cars	8.1%
	Small Cars	7.1%
	Luxury Cars	5.3%
	Vans	4.2%
	Large Cars	0.7%

75% of new vehicle purchases in U.S.

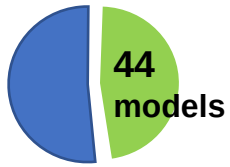
EV model availability (2022)

Pickup Trucks	3 models
Sport Utility Vehicles*	41 models
Small Cars	36 models
Vans	4 models

**includes both crossovers and SUVs*



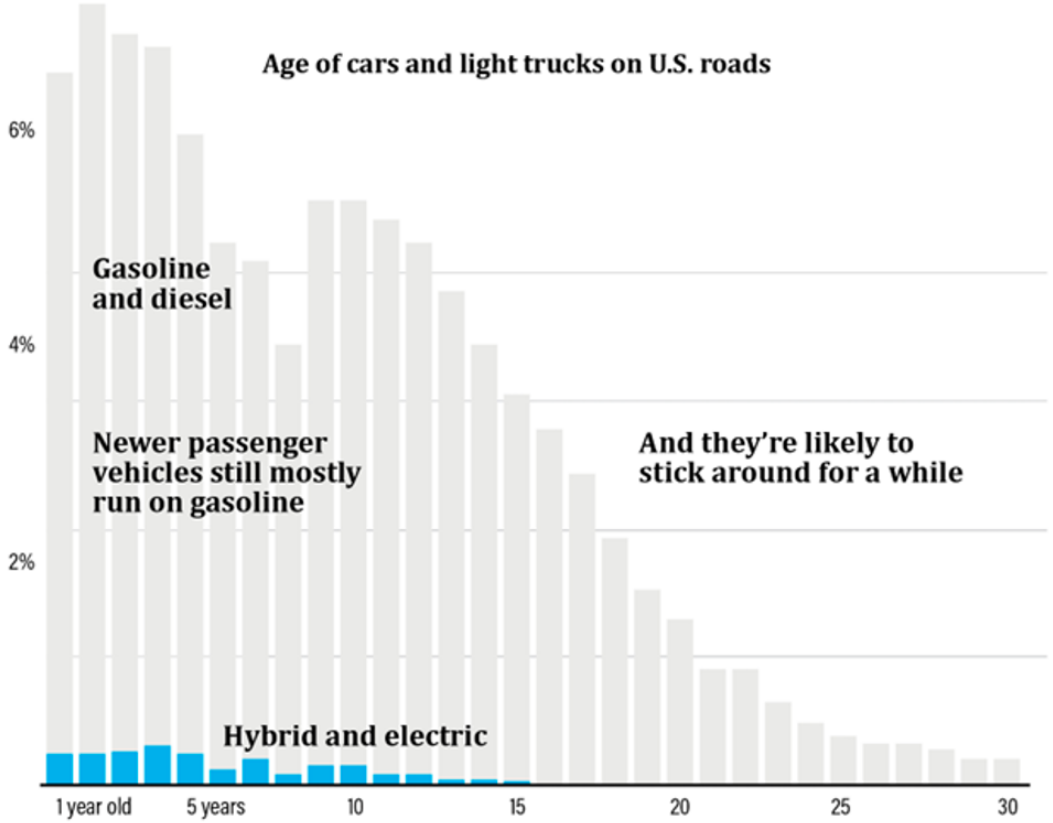
400+ total U.S models



84 total U.S models

Supply side challenges: 74% of vehicle purchases are used vehicles.

43.1 million used vehicles sold in US in 2021 (compared to 15.3 million new vehicles).



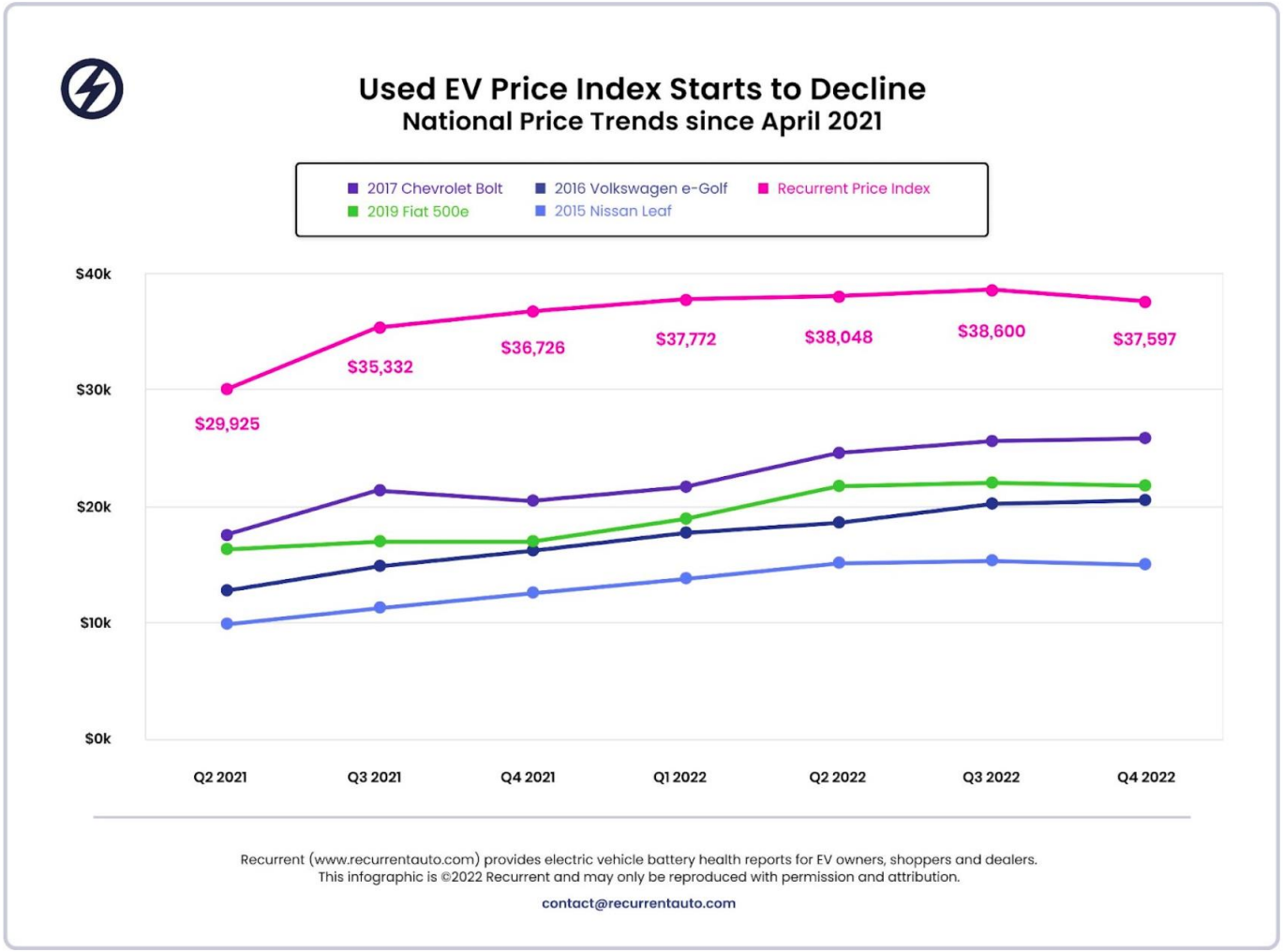
Source: National Household Travel Survey (NHTS) via New York Times. Graphic from New York Times.

- Market availability of more affordable, used electric vehicles is **highly constrained**.
- 2021 Recurrent survey: **50%** of EV buyers interested in a used EV. 2022: closer to **80% interested in used EV**.
- The average resale age of an EV is four years old (compared to used gas vehicles – 6 years old)…
  - ⇢ A large percentage of new EVs are leased (36 months or less)
  - ⇢ Recent fad: EV "flipping"…seller captures tax incentives and financing deals, then resells the barely-driven EV for profit within a few weeks to months.

Supply side challenges: when supply is tight, prices go up.

Average price for a used gas car: **$33,957.**

Average price for a used EV: **$42,700.**



Credit: Recurrent © 2022

Supply side challenges: New federal incentives for used EV purchases will help, but current supply constraints may limit its near-term impact on EV adoption.

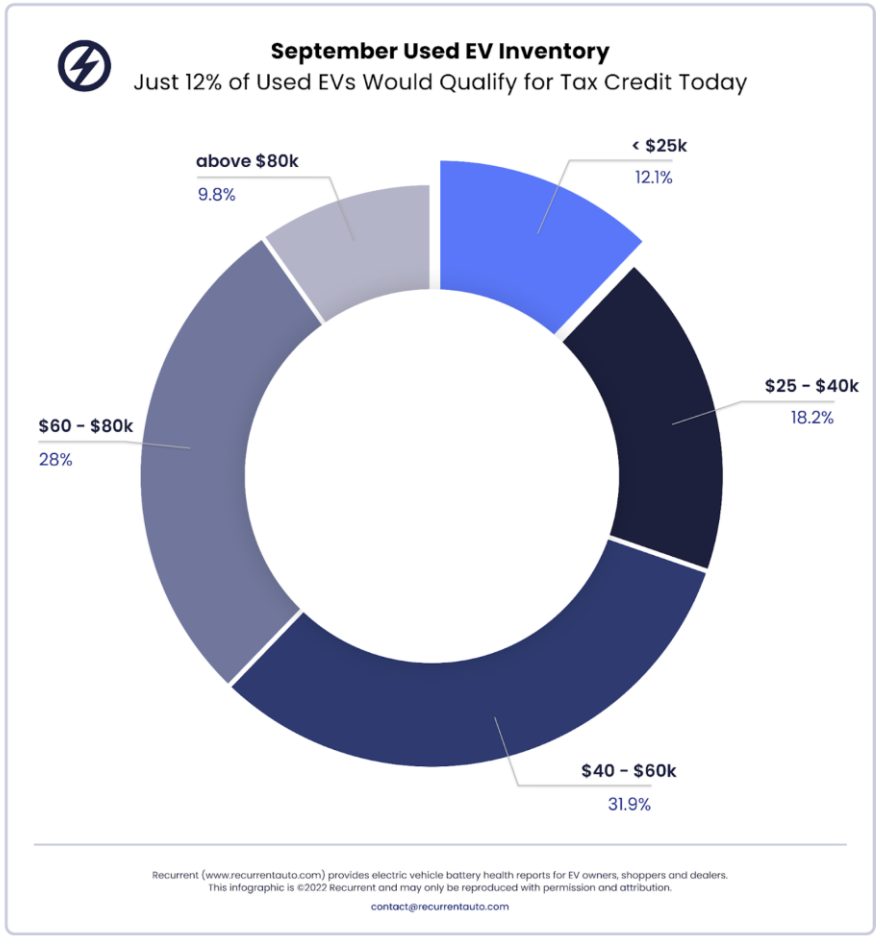
New federal tax credit of up to $4,000 on used EVs priced $25,000 or less…

…but only 17% of used EV sales from Q3 2022 were under $25,000.

…and **only 12% of used EV would qualify for the tax credit today**.

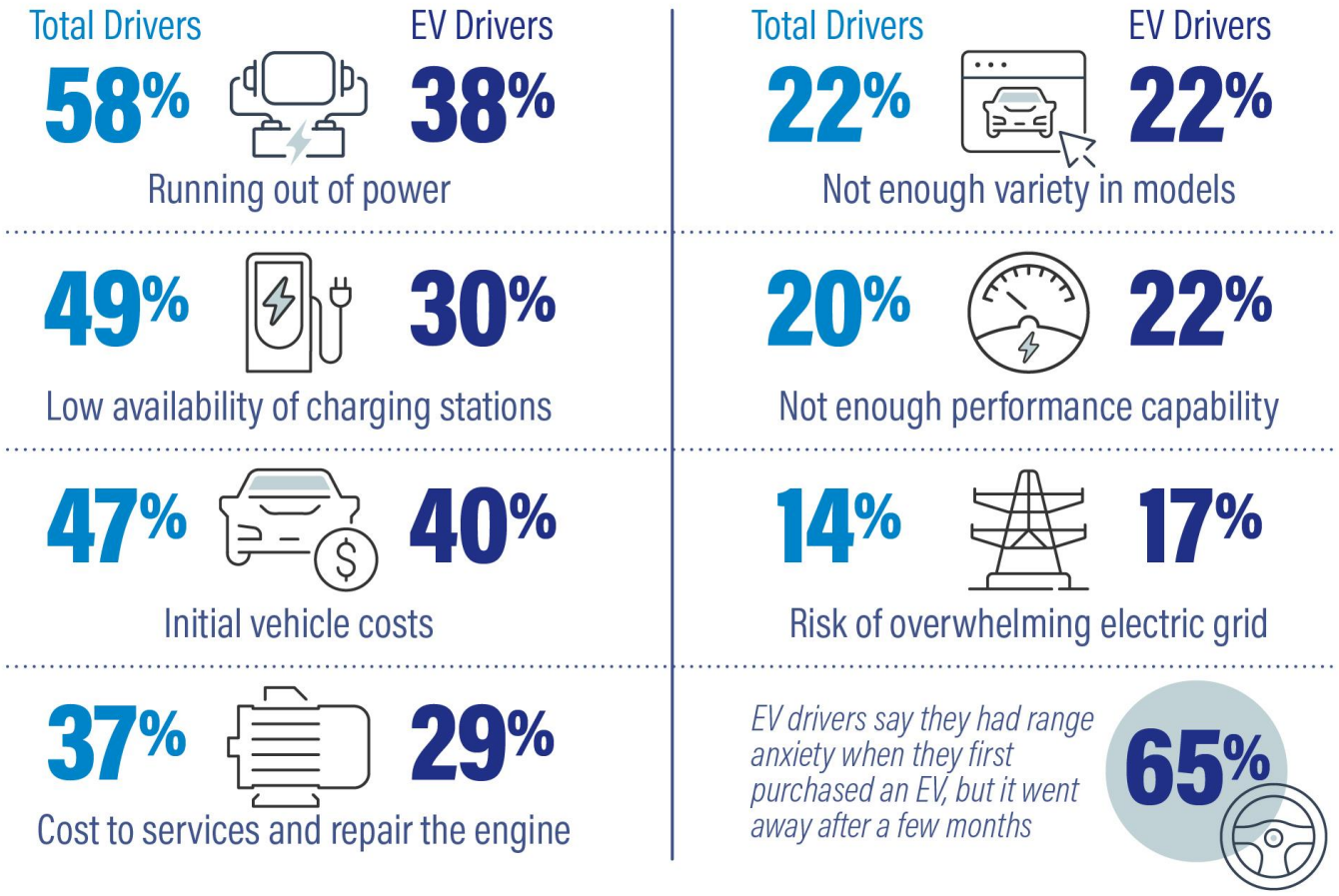
The federal tax credit is only available if the used vehicle is purchased from a licensed dealership…

…but 50% of all used sales in the U.S. are between private parties.

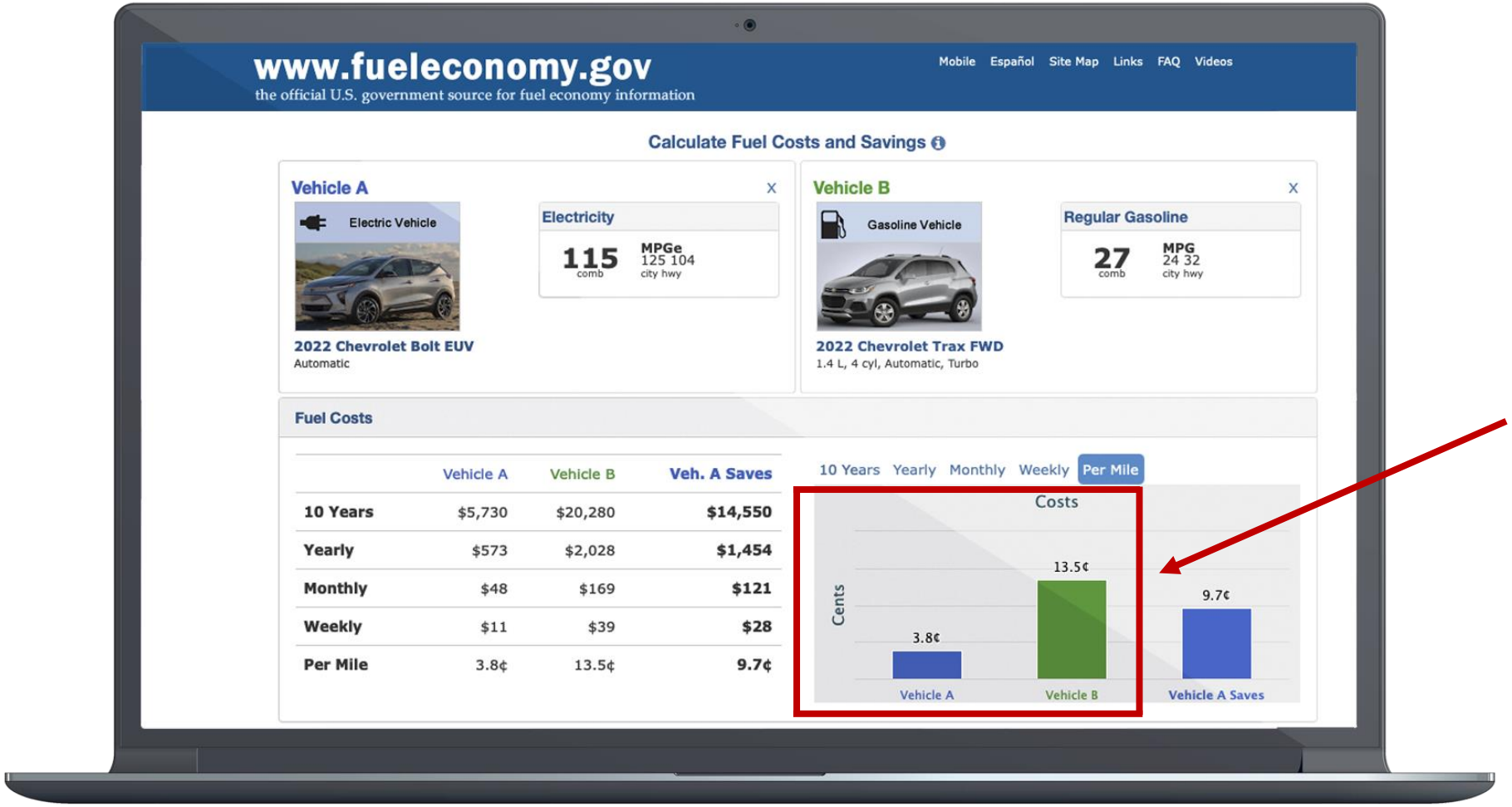


Credit: Recurrent © 2022

Demand side challenges: running out of power is the top concern among potential EV buyers – purchase price concerns have eased as EVs approach price-parity



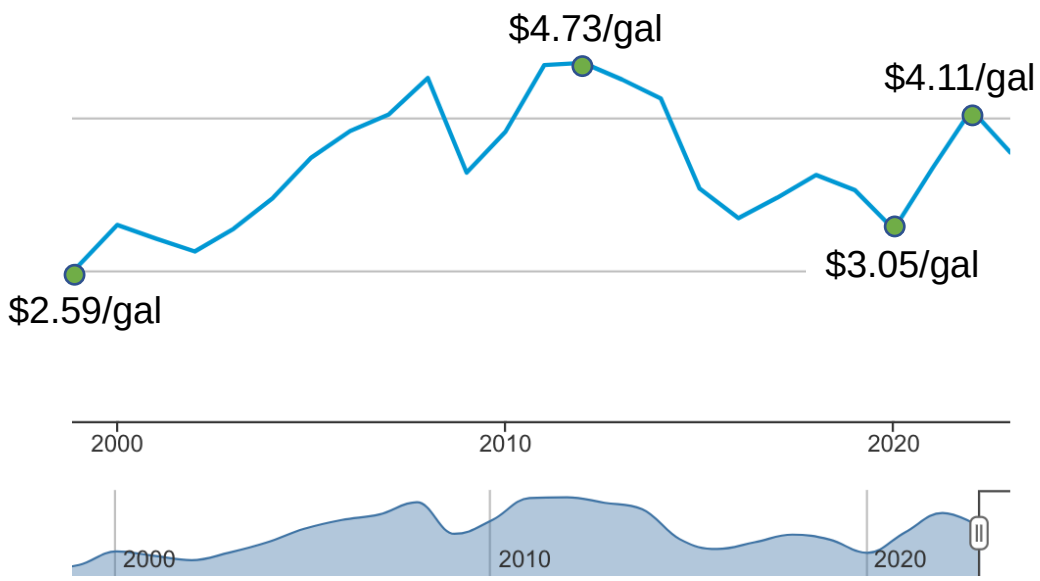
Macro-economic factors: price volatility of fuels (gasoline vs. electric)



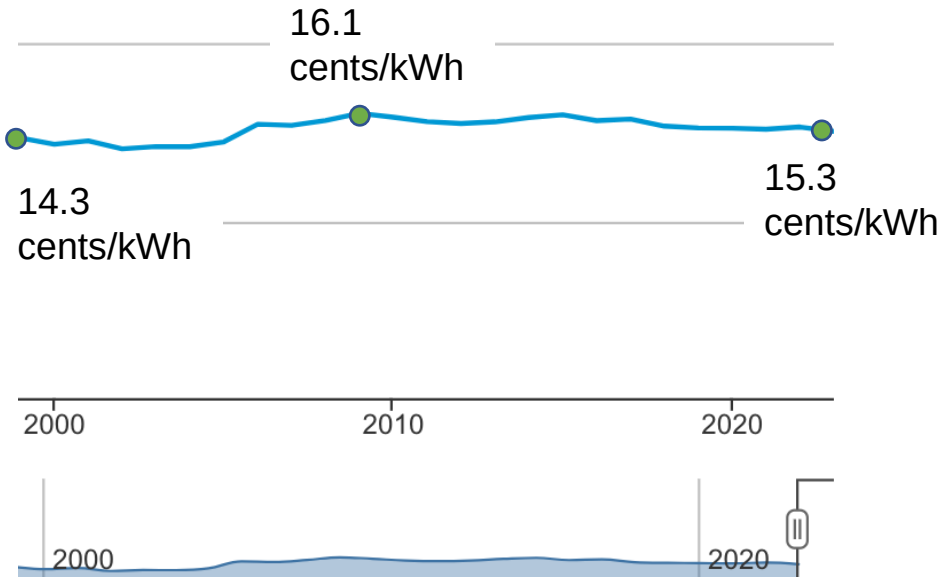
As a motor fuel, electricity in Washington costs significantly less than gasoline – about **4 cents per mile compared to about 14 cents per mile** for gasoline.

Macro-economic factors: price volatility of fuels (gasoline vs. electric)

Electricity prices are relatively stable and predictable, whereas gasoline prices can fluctuate greatly – causing *economic displacement.*



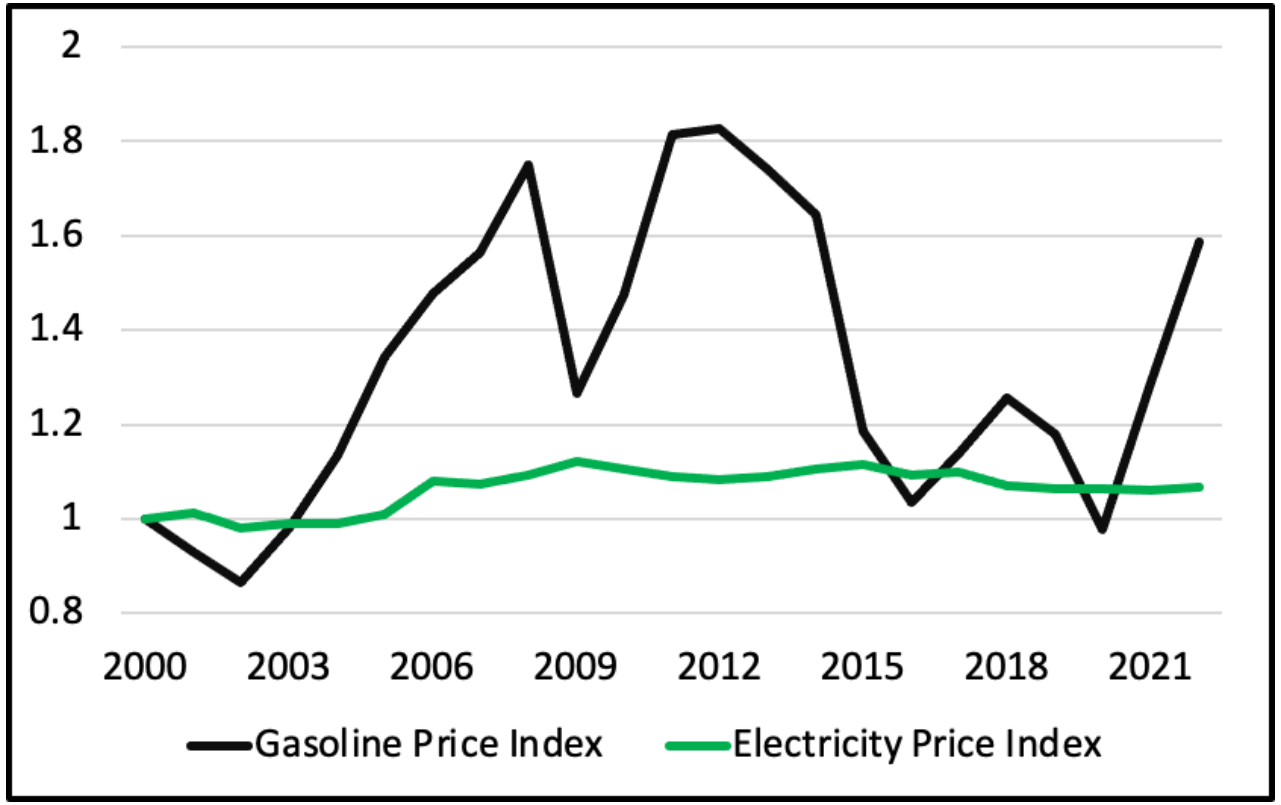
Retail gasoline price volatility



Retail electricity price volatility

Macro-economic factors: price volatility of fuels (gasoline vs. electric)

Electricity prices are relatively stable and predictable, whereas gasoline prices can fluctuate greatly – causing *economic displacement.*



Policy incentives: will be examined in greater detail in forthcoming work, but Washington has been among the leading states in EV adoption incentives.

TAX CREDIT

Up to $7,500

Federal Tax Credit

Due to recent passage of the Inflation Reduction Act of 2022, many EVs and PHEVs no longer qualify for a federal tax incentive. This incentive may return in 2023 for select vehicles.

TAX EXEMPTION

Washington Fuel Cell Electric Vehicle Tax Exemption

Beginning July 1, 2022, 50% of the retail sales and state use tax does not apply to the sale or lease of the first 650 purchases of new passenger vehicles, light-duty trucks, and medium-duty passenger vehicles powered by fuel cells. The maximum value amount eligible for the tax exemption is the less of

TAX EXEMPTION

Washington State EV Infrastructure Tax Exemption

Washington sales and use taxes do not apply to the labor and services for purchasing and installing EV infrastructure, including home charging stations.

TAX EXEMPTION

Up to $1,300

Washington State EV Tax Exemption

New passenger cars, light-duty trucks, and medium-duty passenger vehicles that are dedicated AFVs and under $45,000 are exempt from state motor vehicle sales and use taxes. For used vehicles, the price must be below $30,000. Conditions and limitations apply.

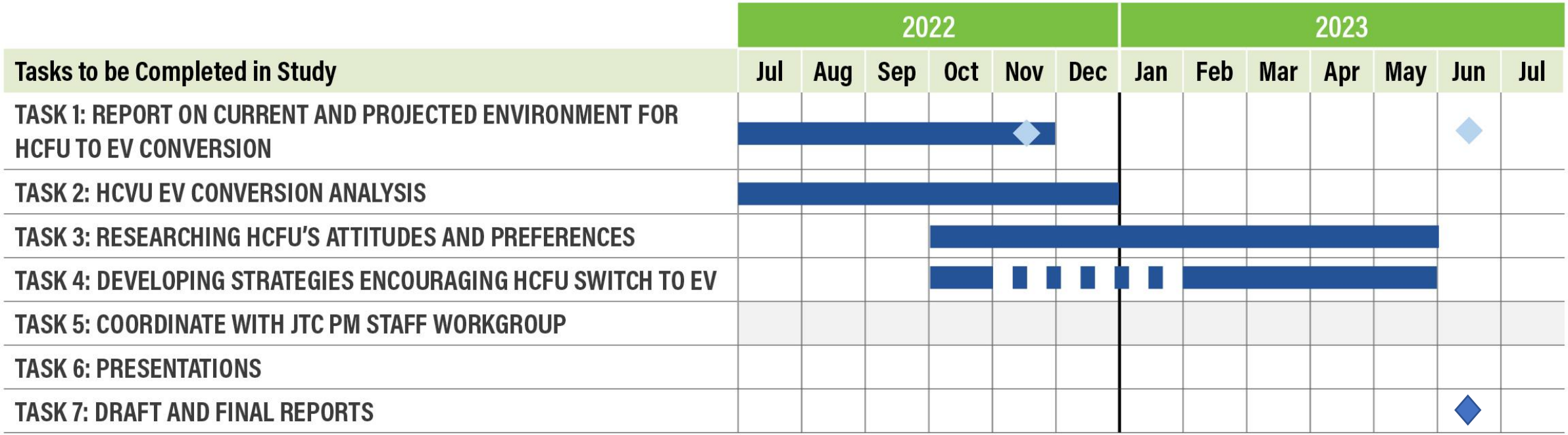
Source: Puget Sound Energy: ev.pse.com/incentives

Policy incentives: will be examined in greater detail in forthcoming work, but Washington has been among the leading states in EV adoption incentives.

EV incentive	Washington	Oregon	California
Tax Credits/Rebates for vehicle purchase	X	X	X
Tax Credits/Rebates for EVSE Installation	X	X	X
Financing Programs (low interest/interest-free)			X
Grants for EVSE Installation	X		
TOU Rates		X	X
Tax Credits/Rebates for purchase/lease of medium- and heavy-duty vehicles	X		X
Commercial Tax Credits/Rebates for EVSE Installation	X		X
Emissions Inspections Exemptions	X		
Grant funding to support planning and deployment of transportation electrification projects		X	

Note: *incentives do not include new federally-funded programs created by the Bipartisan Infrastructure Law of 2022*

Task Schedule



Thank you.